OSSEOUS CYSTS OF THE TIBIA.[1]

By Carl Beck, M.D.,
of New York.

Cysts of the long bones are of a decidedly benign character, and consequently they are accessible to conservative surgical treatment—*i. e.*, to local extirpation; but, unfortunately, their signs resemble those of osteosarcoma so much that the temptation to treat them alike is not small. Osteosarcoma being of a most malignant character demands the most radical steps—that is to say, prompt amputation. Osseous cysts demand simple opening and emptying of the cavity.

The grave prognosis of sarcoma arms the surgeon against any feeling of sentimentality. Under such fatal circumstances he will not shrink from urgently advising one of the most mutilating operations, because he knows that otherwise not only a limb but also life will surely be lost.

On the other hand, how painful must it be for a surgeon to find that because of his error of diagnosis such radical steps have been taken unnecessarily; that, in other words, an extremity was amputated where only an osseous cyst existed, which could have been cured by simple incision.

It is not very difficult to confound the two diseases. Osseous cysts resemble osteosarcoma in their slow and painless onset, often preceded by an injury, in the gradual bulging of the area involved, and in their preference of youthful age. These being characteristic features of osteosarcoma as well as of osseous cyst, it is evident, therefore, that the differential diagnosis cannot be made by considering the history, nor by inspection, nor by palpation.

The fact that the interior of the cyst is filled with opaque, bloody serum and that its walls are lined with a smooth coat, while in osteosarcoma solid masses are formed, indicates that an exploratory incision combined with microscopical examination would clear the question of diagnosis.

But here also, as in many other obscure ailments, the Röntgen rays have showed me their usefulness. Not only do they differentiate well, but they even give us more valuable information than the exploratory incision itself, which, therefore, should always be preceded by skiagraphic examination; and for the patient a photographic exposure is certainly more agreeable than an exploratory operation. After a conservative operation has been decided upon the microscopical examination may well be made after the operation.

[1] Case presented to the Surgical Section of the Academy of Medicine, March 11, 1901.

At a meeting of this section (January 9, 1899) I called attention to the usefulness of the Röntgen rays in a case of femoral aneurism which on account of its extremely thick walls showed no pulsation, so that it had originally been taken for osteosarcoma, an amputation then having been considered.[1]

From a skiagraphic study of a series of osteosarcomas, to be published in detail in another article, I feel justified in saying that in osteosarcoma the outlines of the bone always appear more or less abnormal and indefinite, some areas even appearing entirely translucent; while in osseous cyst the cortex appears thin and narrow, but well marked and regular. The fluid centre of the bone is entirely translucent, the light shade showing the same regularity. The adjacent epiphyses are normal.

It is especially the regularity of the texture of the walls of the cavity as they appear on the skiagraph which seems to me to be the characteristic skiagraphic feature of osseous cyst in contradistinction to the irregular texture of osteosarcoma. I may add that the vicinity of the epiphysis is also in favor of osseous cyst for histological reasons, as will be explained below.

The following cases may serve as a practical illustration of the value of the Röntgen rays in this connection:

CASE I.—H. C., a well-nourished boy, aged ten years, emigrated from Russia several months ago and presented himself to me on November 18, 1900. His family history is good. He was always well until eleven months ago, when he fell into an excavation on the street. On account of the intense pain in the upper portion of his right tibia and the functional disability a fracture was thought of at first, but after having remained in bed for two days he was able to walk around again. Four weeks later he fell again on the street, showing the same symptoms as on the previous accident, but this time he had to stay in bed for four weeks. It was then that a swelling of the size of a large filbert was detected at the spine of the right tibia.

Three months ago he fell for the third time, then being confined to bed for six weeks. When he got up he was free from pain, but he limped and the swelling below his right knee had markedly increased. Walking had become more and more difficult.

The mother reported to me that she had sought surgical advice and that the tumor had been pronounced to be a malignant growth, which demanded immediate amputation in order to save the boy's life.

Inspection revealed a normal and freely movable knee-joint. Nearly the whole upper half of the tibia is occupied by a painless swelling which has the shape of a spindle, and is most pronounced anteriorly. It begins at the epiphyseal line, reaches its height at the upper third of the tibia, and merges gradually into the normal features of the tibia at its middle. The fibula appears to be entirely normal. The circumference of the leg at the most prominent point is 30 cm., while that of the left leg measures 25 cm. (Fig. 1.) The surface of the tumor is smooth. Its consistency is hard; a few areas appear slightly softer. Forcible pressure reveals the presence of œdema. There is neither pulsation nor fluctuation. The skin is normal and movable. The inguinal region does not show the presence of swollen glands.

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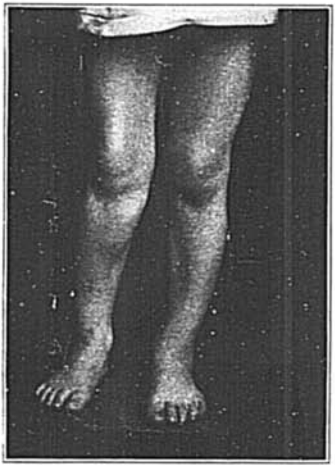
[1] "On the Difficulty of Differentiating between Femoral Aneurism and Osteosarcoma." International Clinics, vol. iv., ninth series.

It was no more than natural, in view of these facts, to think that an osteoscarcoma had to be dealt with; but before arriving at a definite conclusion I consulted the Röntgen rays, which revealed the presence of a large triangular shade, the base of which corresponded to the epiphyseal line. The triangle was surrounded by a narrow, dark, and regularly arranged shade, which represented the distended but otherwise normal cortex of the tibia. The light shade was interpreted as a cavity, presumably containing a fluid of some kind. The normal outlines of the fibula can be distinctly recognized through the light area, although the inner surface of the leg rested on the photographic plate. (Fig. 2.)

FIG. 1.

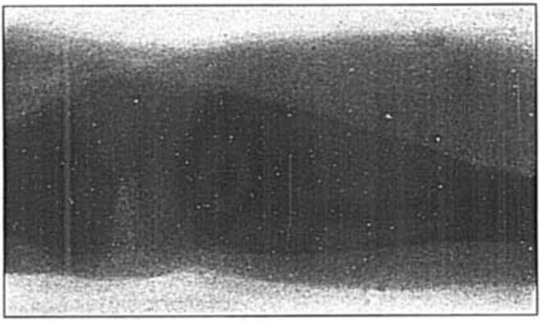


Osseous cyst of the right tibia.

The marked regularity of the texture of the cortex, as well as the uniformity of the light shade representing the cavity, convinced me that osteosarcoma was not present in this case, wherefore I advised a conservative operation. This was performed at St. Mark's Hospital, November 21, 1900.

The anterior surface of the tumor was first exposed. After having incised the thin bone shell with a bone-knife bloody serum escaped through the opening made. Now an elliptic portion was removed from the osseous shell in order to get access to the large cavity, which was filled with black, bloody, viscid serum. There were no coagula. The osseous walls were lined with a thin membrane and the cavity was traversed by a few fibres of osseous remnants, arranged like network, but not much thicker than a thread.

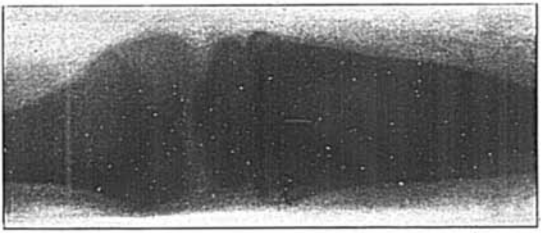
FIG. 2.



Osseous cyst of the tibia near its upper epiphysis.

After having scooped out the cavity thoroughly its osseous walls were so thin that by pressing them together forcibly—in fracturing them, in fact—their inner surfaces could be well approximated, so that no more cavity existed, so to say. Instead of packing the cavity I preferred to resort to this unusual procedure, analogous to the principles

FIG. 3.



Osseous cyst of right tibia, two months after operation. The light shade at the centre of the tibia, beginning below the epiphyseal line, indicates the presence of a sinus.

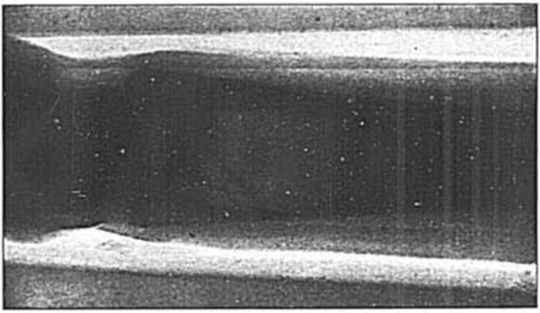
of approximation of the chest wall in old pyothorax. Only in the lower edge of the bone wound a small iodoform wick was introduced.

There was considerable bloody oozing until five days after the operation, then the secretion became serous. Recovery was uninterrupted. Only a small sinus, discharging a few drops of serum in a day, is still present. The patient has now been up for two weeks and walks well. The repair is also well illustrated by the skiagraph (Fig. 3), which was taken two months after operation.

The microscopical examination of the exsected bone-fragment and its membrane, made by the courtesy of Dr. Henry T. Brooks, showed the presence of many round cells, especially around the bloodvessels. There was no epithelial stratum nor any evidence of bacteria.

Case II.—E. T., a girl aged thirteen years, born in New York City, presented herself to me on April 4, 1899. Eight months ago she slipped on a stairway and was unable to stand on her feet again. The left ankle became swollen and painful. Fomentations were applied for several weeks. No medical advice was sought until the swelling, which after four weeks' rest had become painless, increased.

Fig. 4.



Osseous cyst of the tibia near its lower epiphysis.

The family history of the patient is good. Inspection reveals a movable ankle-joint. The lower third of the tibia is occupied by a painless tumor, which appears like exuberant callus-formation. The external malleolus is normal. The circumference of the leg at the most prominent point is 22 cm., while that of the right leg measures 18 cm. The surface of the tumor is smooth; the consistency is hard. A skiagraph taken at once revealed the same condition present in Case I., with the difference that the shade of the cortex is somewhat larger. (Fig. 4.)

The operation was the same as in Case I. The cavity contained the same black, viscid serum; the walls of the cavity, however, were thicker than those of Case I., and to their inner surface a stratum of grayish-white tissue was attached. It had the appearance of enchondromatous masses and proved to consist of cartilaginous tissue. The microscopical examination revealed an abundance of nuclei, especially of round cells, surrounded by myxomatous and disintegrated tissue. The walls could not be approximated as well as in Case I. by forcible compression. The remainder of the cavity, therefore, was packed with iodoform gauze. Recovery was perfect after four and a half months. The patient has remained well ever since.

The etiology of osseous cysts is still *sub judice*. Virchow[1] maintains that all osseous cysts are the softened products of degeneration of such growths that were solid formerly. Such solid tumors may have originated from erratic cartilaginous fragments left from the epiphyseal line.

Schlange,[2] according to his excellent monograph, observed cartilaginous fragments in the tissues of the cyst-wall. Similar observations were made by Franz Koenig[3] and by Deetz.[4]

At the early stage osseous cysts, be they in the tibia or in the femur, are easily overlooked, the symptoms being insignificant. Sometimes there is very slight intermittent pain. The joints are freely movable and neither inspection nor palpation reveals any abnormality. After months the circumference of the extremity may appear very slightly enlarged, but the symptoms may not be fully appreciated until a fall on the thin shell of the cortex produces a fracture. Whether in our cases fracture had occurred could not be learned. Relying upon the Röntgen rays, I am inclined to believe that the previous injuries had the character of severe contusions. In view of the difficulty of differentiating between a benign cyst, accessible to conservative surgery, and osteosarcoma, demanding the most radical measures, I would advocate exposing all osseous growths to the Röntgen rays before passing a final judgment in a matter of such grave importance.

A CLINICAL AND HISTOLOGICAL STUDY OF A CASE OF CIRCUMCORNEAL HYPERTROPHY OF THE CONJUNCTIVA.

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Through the kindness of Dr. J. P. Worrell, of Terre Haute, Ind., I received a small piece of tissue together with the following clinical report:

On May 5, 1894, J. A. A., a farmer, aged sixty-one years, of excellent family history and without any evidences of constitutional disease,

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[1] Ueber die Bildung von Knochencysten, Monatsbericht der Berliner Akademie der Wissenschaften. Mathematisch-physikalische Klasse, 1876.

[2] Beiträge zur anatomischen und klinischen Kenntniss der Cysten in den langen Roehrenknochen, Festschrift fuer Esmarch, 1893, page 431.

[3] Langenbeck's Archives, Band lvi., Heft 3.

[4] Beiträge zur klinischen Chirurgie, Band xxvi., Heft 1.